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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,023	06/24/2003	Marc Weydert	DN2002105	2594

27280 7590 08/31/2009
THE GOODYEAR TIRE & RUBBER COMPANY
INTELLECTUAL PROPERTY DEPARTMENT 823
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EXAMINER

CHEUNG, WILLIAM K

ART UNIT	PAPER NUMBER
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1796

MAIL DATE	DELIVERY MODE
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08/31/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/603,023	Applicant(s) WEYDERT ET AL.	
	Examiner WILLIAM K. CHEUNG	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/11/2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-12 and 16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In view of amendment filed June 11, 2009, claims 6, 13-15, 17-21 have been cancelled. Claims 1-5, 7-12, 16 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-5, 7-12, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corvasce et al. (U.S Patent 5,672,639) in view of Huynh-Tran et al. (US 2003/0152758) for the reasons adequately set forth from paragraph 4 of the office action of March 19, 2009.

1. (Currently Amended) A tire having a tread comprised of a vulcanizable rubber composition comprising:
- (A) 100 parts by weight of at least one diene-based elastomer wherein selected from the group consisting of natural or synthetic cis 1,4-polyisoprene rubber, 3,4-polyisoprene rubber, styrene/butadiene copolymer rubbers, isoprene/butadiene copolymer rubbers, styrene/isoprene copolymer rubbers, styrene/isoprene/butadiene terpolymer rubbers, cis 1,4-polybutadiene rubber and medium to high vinyl polybutadiene rubber having a vinyl 1,2- content in a range of about 15 to about 85 percent and emulsion polymerization prepared butadiene/acrylonitrile copolymers;
- (B) from about 1 to about 60 phr of a starch/synthetic plasticizer composite; and
- (C) from ~~4.5 to 10~~ 9 to 10 phr of an adduct of maleic anhydride and polybutadiene.

The prior art to Corvasce et al. relates to a rubber composition containing a (A) 100 parts by weight of at least one diene-based elastomer, (B) about 0.1 to about 120 phr of at least one reinforcing filler for said elastomer(s) comprised of at least one starch/plasticizer composite (Column 15, line 48-52). Regarding the claimed "tread" feature of claim 1, Corvasce et al. (col. 21-23, claims 47-86, particularly 67-86) clearly disclose using the disclosed tire having a tread comprising the rubber composition of Corvasce et al.

In regard to Claim 7, Corvasce et al. further disclose that the starch used in the starch/synthetic plasticizer is composed of amylose units and amylopectin units in a ratio of about 15/85 to about 35/65, and has a softening point according to ASTM No. D1228 in a range of about 180 °C to about 220 °C provided, however, that said starch/plasticizer composite has a softening point in a range of about 110 to about 160 °C according to ASTM No. D1228 (column 15, line 56-62).

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In regard to Claim 8, Corvasce et al. disclose that the starch/synthetic plasticizer herein said plasticizer is a liquid at 23 °C. and is selected from at least one of poly(ethylenevinyl alcohol), cellulose acetate and plasticizers based, at least in part, upon diesters of dibasic organic acids and forms said starch/plasticizer composite having a softening point in a range of about 110 °C. to about 160 °C. when combined with said starch in a weight ratio in a range of about 1/1 to about 2/1 (column 16, line 34-41).

In regard to Claim 9, Corvasce et al. disclose that starch/synthetic plasticizer herein said plasticizer has a softening point of less than the said starch and less than 160 °C. and is selected from at least one of poly(ethylenevinyl alcohol), cellulose acetate and copolymers, and hydrolyzed copolymers, of ethylene-vinyl acetate copolymers having a vinyl acetate molar content of from about 5 to about 90, alternatively about 20 to about 70, percent, ethylene-glycidal acrylate copolymers and ethylene-maleic anhydride copolymers (column 17, line 7-15).

In regard to Claim 10, Corvasce et al. teach that diene based elastomer used in the rubber composition formulation is selected from at least one of homopolymers of isoprene and 1,3-butadiene and copolymers of isoprene and/or 1,3-butadiene with a aromatic vinyl compound selected from at least one of styrene and alphas-methylstyrene (column 17, line 50-55).

In regard to Claims 11 and 12, Corvasce et al. teach that the rubber reinforcing carbon black is used in conjunction with the starch composite in an amount of at least 5 and preferable at least 35 phr of carbon black (column 5, line 41-44) and, if silica is

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used as a reinforcement together with carbon black, the weight ratio of silica to carbon black is desirably in a weight ratio in a range of about 0.1/1 to about 10/1 (column 6, line 14-16).

In regard to claim 16, the claimed glass transition temperature would be inherently possessed by the composition obviated by Corvasce et al. in view of Huynh-Tran et al.

The difference between the prior art and the present invention is the using of an adduct of maleic anhydride and polybutadiene in the rubber composition formulations. Corvasce et al. do not disclose that an adduct of maleic anhydride and polybutadiene can be used in making the rubber composition.

Corvasce et al. (col. 16, claim 6; col. 21, claim 52; col. 22, claim 72) disclose rubber composition, rubber tire, and rubber tire having a tread comprising polyester fibers. Since Huynh-Tran et al. (page 1, [0002]) provides an adhesion promoter comprising maleinized polybutadiene to synergistically improve adhesion of the rubber to polymeric fiber (page 2, [0022 and [0023]], it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the adduct of maleic anhydride and polybutadiene, as taught by Huynh-Tran et al., in Corvasce et al.' rubber composition formulation because Huynh-Tran et al. have successfully exemplified incorporating a maleinized polybutadiene in a similar rubber composition with increased adhesion to polymeric fibers.

As to claims 2-3, Huynh-Tran et al. use a maleinized polybutadiene with a M_n of 5100 (page 6, [0050]). Huynh-Tran et al.'s disclosure on page 6, [0050] and [0051] renders obvious the characteristic of the maleinized polybutadiene as instantly claimed.

Regarding the claimed range amount of maleinized polybutadiene recited in claims, Huynh-Tran et al. (page 6, [0056]) clearly disclose 3, 5 or 10 wt% of maleinized polybutadiene in the disclosed rubber composition. Although the claimed range amount of maleic anhydride/polybutadiene adduct are in phr units, the recited 1.5 to 8 phr range in claims 1 and 18 corresponds to a range from about 1 to 5.2 weight percent in view of total weight as disclosed in applicants' specification (page 18, Tables 1 and 2). For the same rationale, the recited 1.5 to 6 phr range in claims 17 and 19 corresponds to a range from about 1 to 4 weight percent. Since Huynh-Tran et al. (page 6, [0056]) clearly disclose 3, and 5 wt% of maleinized polybutadiene in the disclosed rubber composition. Motivated by the expectation of success of synergistically improve adhesion of the rubber to polymeric fiber (page 2, [0022 and [0023]], it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the adduct of maleic anhydride and polybutadiene, as taught by Huynh-Tran et al., in Corvasce et al.'s rubber composition formulation because Huynh-Tran et al. have successfully exemplified incorporating a maleinized polybutadiene in a similar rubber composition with increased adhesion to polymeric fibers.

Response to Argument

4. Applicant's arguments filed June 11, 2009 have been fully considered but they are not persuasive.

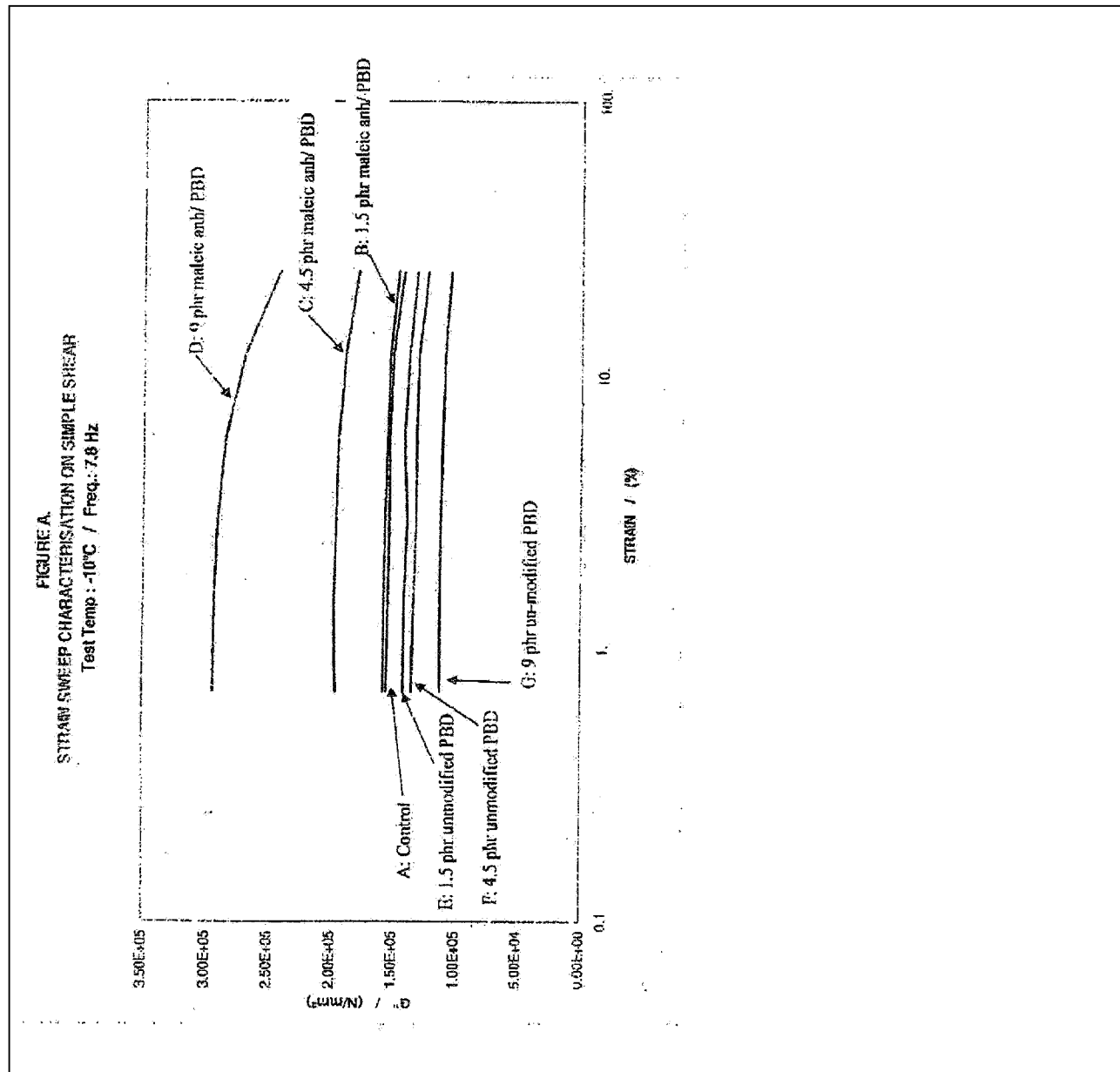
Applicants argue that the claims as amended are now fully commensurate in scope with the showing of unexpected results in the specification, and as such the showing of unexpected results is sufficient to overcome prima facie obviousness of the claims. However, the examiner disagrees because even when the comparative data that are considered commensurate to the scope of the claims and the prior applied for the rejection, applicants are required to establish that the "unexpected results" are truly "unexpected".

For the instant application, the declaration filed September 15, 2008 fails to establish that the "comparative data" have shown the criticality of the claimed "maleinized" feature because the argued "unexpected" results are actually "expected" in view of the teachings of Corvasce et al. and Huynh-Tran et al. Applicants argue that the maleinized polybutadiene adduct composition exhibits loss modulus properties at 10 °C that are nonlinear over the strain range while the loss modulus properties at 10 °C of un-modified polybutadiene composition is constant over the strain range. However, such argument is not persuasive because the control samples which include the un-modified polybutadiene samples also exhibit non-linearity in loss modulus properties in the entire measured strain ranges.

Regarding applicants' argument that the lower stiffness at large strain may be attributed to the softer core shell with the adduct of maleic anhydride and polybutadiene

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as compared to the un-modified polybutadiene, the argument is not supported by the comparative data as submitted. Applicants must recognize that the entire loss modulus ranges of the maleinized polybutadiene samples are significantly higher as compared to the un-modified polybutadiene samples (see the following Figure).



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Regarding the increase of the entire loss modulus ranges of the maleinized polybutadiene samples, applicants must recognize that maleinized polybutadiene comprises a higher maleic anhydride content and a lower butadiene (soft segment) content as compared to the samples containing un-modified polybutadiene. As expected by one of ordinary skill in art, a higher maleic anhydride content compounding with a lower polybutadiene contents cause the loss modulus of the maleinized polybutadiene containing samples to be elevated (not lowered) for the entire strain range as shown in the figure as shown above. In view of the reasons set forth above, the comparative data filed fail to show the criticality of the claimed invention. Applicants must also recognize that Huynh-Tran et al. (page 1, [0002]) clearly teach that adhesion is a significant factor in the overall performance of composite materials, which implies a significant improvement or impact on the mechanical properties such as the argued "loss modulus" properties.

Applicants also argue that the comparative data show "expected results" in that sample C (9 phr of maleinized polybutadiene) exhibits more pronounced nonlinearity in G'' . Applicants also argue that 9 phr of maleinized polybutadiene exhibits more G'' loss as compared to the other samples. However, such argument is not persuasive because the control samples which include the un-modified polybutadiene samples also exhibit non-linearity in loss modulus properties in the entire measured strain ranges.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William K. Cheung whose telephone number is (571) 272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/William K Cheung/
Primary Examiner, Art Unit 1796

William K. Cheung, Ph. D.
Primary Examiner
August 19, 2009